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MAY 6 - 1968

CURRENT SERIAL RECORDS

WATER SUPPLY OUTLOOK FOR WASHINGTON

and
FEDERAL - STATE - PRIVATE COOPERATIVE SNOW SURVEYS

UNITED STATES DEPARTMENT of AGRICULTURE---SOIL CONSERVATION SERVICE,

and

DEPARTMENT of WATER RESOURCES STATE of WASHINGTON

Data included in this report were obtained by the agencies named above in cooperation with the U.S. Forest Service, U.S. Geological Survey, National Park Service, and other Federal, State and Private organizations.

AS OF
MAR. 1, 1968

TO RECIPIENTS OF WATER SUPPLY OUTLOOK REPORTS:

Most of the usable water in western states originates as mountain snowfall. This snowfall accumulates during the winter and spring, several months before the snow melts and appears as streamflow. Since the runoff from precipitation as snow is delayed, estimates of snowmelt runoff can be made well in advance of its occurrence. Streamflow forecasts published in this report are based principally on measurement of the water equivalent of the mountain snowpack.

Forecasts become more accurate as more of the data affecting runoff are measured. All forecasts assume that climatic factors during the remainder of the snow accumulation and melt season as they affect runoff will add to be an effective average. Early season forecasts are therefore subject to a greater change than those made on later dates.

The snow course measurement is obtained by sampling snow depth and water equivalent at surveyed and marked locations in mountain areas. A total of about ten samples are taken at each location. The average of these are reported as snow depth and water equivalent. These measurements are repeated in the same location near the same dates each year.

Snow surveys are made monthly or semi-monthly from January 1 through June 1 in most states. There are about 1400 snow courses in Western United States and in the Columbia Basin in British Columbia. In the near future, it is anticipated that automatic snow water equivalent sensing devices along with radio telemetry will provide a continuous record of snow water equivalent at key locations.

Detailed data on snow course and soil moisture measurements are presented in state and local reports. Other data or reservoir storage, summaries of precipitation, current streamflow, and soil moisture conditions at valley elevations are also included. The report for Western United States presents a broad picture of water supply outlook conditions, including selected streamflow forecasts, summary of snow accumulation to date, and storage in larger reservoirs.

Snow survey and soil moisture data for the period of record are published by the Soil Conservation Service by states about every five years. Data for the current year is summarized in a West-wide basic data summary and published about October 1 of each year.

PUBLISHED BY SOIL CONSERVATION SERVICE

D. A. WILLIAMS, Administrator

The Soil Conservation Service publishes reports following the principal snow survey dates from January 1 through June 1 in cooperation with state water administrators, agricultural experiment stations and others. Copies of the reports for Western United States and all state reports may be obtained from Soil Conservation Service, Western Regional Technical Service Center, Room 507, 701 N. W. Glisan, Portland, Oregon 97209.

Copies of state and local reports may also be obtained from state offices of the Soil Conservation Service in the following states:

STATE	ADDRESS
Alaska	P. O. Box "F", Palmer, Alaska 99645
Arizona	6029 Federal Building, Phoenix, Arizona 85205
Colorado (N. Mex.)	12417 Federal Building, Denver, Colorado 80202
Idaho	P. O. Box 38, Boise, Idaho 83707
Montana	P. O. Box 98, Bazeman, Montana 59715
Nevada	P. O. Box 4850, Reno Nevada 89505
Oregon	1218 S. W. Washington St., Portland, Oregon 97205
Utah	4012 Federal Building, Salt Lake City, Utah 84111
Washington	360 Federal Office Building, Spokane, Washington 99201
Wyoming	P. O. Box 340, Casper, Wyoming 82602

PUBLISHED BY OTHER AGENCIES

Water Supply Outlook reports prepared by other agencies include a report for California by the Water Supply Forecast and Snow Surveys Unit, California Department of Water Resources, P. O. Box 388, Sacramento, California 95802 --- and for British Columbia by the Department of Lands, Forests and Water Resources, Water Resources Service, Parliament Building, Victoria, British Columbia



WATER SUPPLY OUTLOOK FOR WASHINGTON

and
FEDERAL - STATE - PRIVATE COOPERATIVE SNOW SURVEYS

Issued by

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In Cooperation with

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STATE OF WASHINGTON

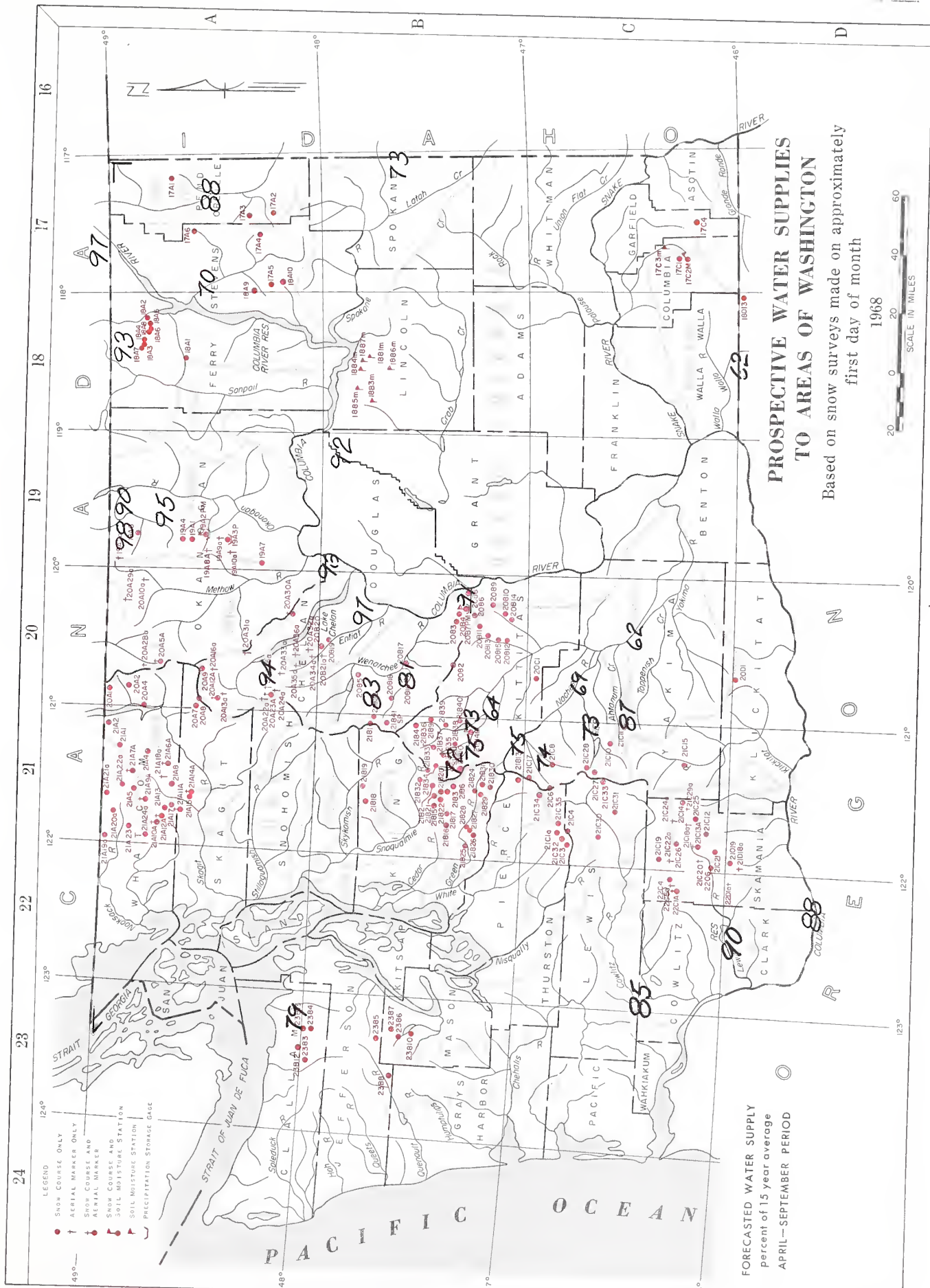
Report prepared by

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SOIL CONSERVATION SERVICE
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INDEX to WASHINGTON SNOW COURSES, SOIL MOISTURE STATIONS and PRECIPITATION STORAGE CAGES

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INDEX to WASHINGTON SNOW COURSES, SOIL MOISTURE STATIONS and PRECIPITATION STORAGE GAGES

NAME	NUMBER	SEC. TWP.	RANGE	ELEV.	NAME	NUMBER	SEC. TWP.	RANGE	ELEV.	NAME	NUMBER	SEC. TWP.	RANGE	ELEV.	NAME	NUMBER	SEC. TWP.	RANGE	ELEV.						
UPPER COLUMBIA DRAINAGE																									
Pend Oreille River																									
Boyer Mountain	17A2	7	31N	43E	5250	Squillchuck Creek														Lewis River (continued)					
Bunchgrass Meadow	17A1	24	37N	44E	5000	20B3	12	21N	19E	4400	20B4	18	21N	20E	3400	21C09a	21	WN	10E	5600					
Winchester Creek	17A3	30	33N	43E	2970	Stemilt Creek				Cedar River											Skagit River				
						20B6	34	21N	20E	4450	20B7PM	30	21N	20E	4400	21C09b	28	WN	7E	3500					
Kettle River																				Skagit River					
Boulder Road	18A2	36	39N	36E	1450	Crab Creek				Snoqualmie River											Skagit River				
Butte Creek	18A3	28	39N	35E	4070	18B3M	32	27N	34E	2440	18B3M	32	27N	31E	2750	21C09c	14	WN	8E	4250					
Cabin Creek	18A4	26	39N	35E	3595	18B3M	32	27N	31E	2750	18B3M	32	27N	31E	2750	21C09d	14	WN	8E	4250					
Goat Creek	18A5	3	38N	36E	2150	18B3M	32	27N	31E	2750	18B3M	32	27N	31E	2750	21C09e	14	WN	8E	4250					
Snow Caps Creek	18A6	5	38N	36E	2720	18B3M	32	27N	31E	2750	18B3M	32	27N	31E	2750	21C09f	14	WN	8E	4250					
Snow Caps Trail	18A7	20	39N	35E	4600	18B3M	32	27N	31E	2750	18B3M	32	27N	31E	2750	21C09g	14	WN	8E	4250					
Summit G. S.	18A7	20	39N	35E	4600	18B3M	32	27N	31E	2750	18B3M	32	27N	31E	2750	21C09h	14	WN	8E	4250					
Colville River																				Skagit River					
Saard	17A6	19	36N	42E	3215	Crab Creek				Snoqualmie River											Skagit River				
Carlson	18A9	34	32N	38E	2885	18B3M	32	27N	34E	2440	18B3M	32	27N	31E	2750	21C09i	14	WN	8E	4250					
Chevelah	17A7	11	32N	41E	4955	18B3M	32	27N	31E	2750	18B3M	32	27N	31E	2750	21C09j	14	WN	8E	4250					
Stranger Mountain	17A5	26	31N	38E	4990	18B3M	32	27N	31E	2750	18B3M	32	27N	31E	2750	21C09k	14	WN	8E	4250					
Togo	18A10	6	29N	38E	3370	18B3M	32	27N	31E	2750	18B3M	32	27N	31E	2750	21C09l	14	WN	8E	4250					
Sanpoil River																				Skagit River					
Sherman Creek Pass	18A1	19	36N	35E	5350	Crab Creek				Snoqualmie River											Skagit River				
						18B3M	32	27N	31E	2750	18B3M	32	27N	31E	2750	21C09m	14	WN	8E	4250					
Okanogan River																				Skagit River					
Clark	19A8a	2	36N	23E	7000	Crab Creek				Snoqualmie River											Skagit River				
Mucknuck	19A9a	20	36N	24E	6750	18B3M	32	27N	31E	2750	18B3M	32	27N	31E	2750	21C09n	14	WN	8E	4250					
Nutton Creek No. 1	19A1	30	37N	24E	5700	18B3M	32	27N	31E	2750	18B3M	32	27N	31E	2750	21C09o	14	WN	8E	4250					
Nutton Creek No. 2	19A2	30	37N	24E	6000	18B3M	32	27N	31E	2750	18B3M	32	27N	31E	2750	21C09p	14	WN	8E	4250					
Paysayten	20A28a	32	40N	18E	4300	18B3M	32	27N	31E	2750	18B3M	32	27N	31E	2750	21C09q	14	WN	8E	4250					
Rusty Creek	19A3P	18	35N	24E	4000	18B3M	32	27N	31E	2750	18B3M	32	27N	31E	2750	21C09r	14	WN	8E	4250					
Salmon Meadows	19A2PM	33	37N	24E	4500	18B3M	32	27N	31E	2750	18B3M	32	27N	31E	2750	21C09s	14	WN	8E	4250					
Starvation Mtn.	19A10a	15	35N	23E	6750	18B3M	32	27N	31E	2750	18B3M	32	27N	31E	2750	21C09t	14	WN	8E	4250					
Tout's Coulee	19A6	30	39N	25E	2845	18B3M	32	27N	31E	2750	18B3M	32	27N	31E	2750	21C09u	14	WN	8E	4250					
Methow River																				Skagit River					
Silly Goat Pass	20A10a	10	38N	20E	6400	Crab Creek				Snoqualmie River											Skagit River				
Dollar Watch	20A29a	8	39N	20E	7000	18B3M	32	27N	31E	2750	18B3M	32	27N	31E	2750	21C09v	14	WN	8E	4250					
Harris Pass	20A5a	7	37N	18E	6500	18B3M	32	27N	31E	2750	18B3M	32	27N	31E	2750	21C09w	14	WN	8E	4250					
Horseshoe Basin	19A5a	15	40N	23E	7000	18B3M	32	27N	31E	2750	18B3M	32	27N	31E	2750	21C09x	14	WN	8E	4250					
Loup Loup	19A7	36	34N	23E	4650	18B3M	32	27N	31E	2750	18B3M	32	27N	31E	2750	21C09y	14	WN	8E	4250					
Chelon Lake Basin																				Skagit River					
Cloudy Pass	20A22a	12	31N	15E	6500	Crab Creek				Snoqualmie River											Skagit River				
Greenwood Flat	20A25a	3	31N	16E	3540	18B3M	32	27N	31E	2750	18B3M	32	27N	31E	2750	21C09z	14	WN	8E	4250					
Lyman Lake	20A24a	8	31N	16E	5275	18B3M	32	27N	31E	2750	18B3M	32	27N	31E	2750	21C09aa	14	WN	8E	4250					
Park Creek Flat	20A23a	18	34N	16E	5900	18B3M	32	27N	31E	2750	18B3M	32	27N	31E	2750	21C09ab	14	WN	8E	4250					
Park Creek Ridge	20A13a	7	34N	16E	4600	18B3M	32	27N	31E	2750	18B3M	32	27N	31E	2750	21C09ac	14	WN	8E	4250					
Petersons	20A12a	3	34N	16E	4600	18B3M	32	27N	31E	2750	18B3M	32	27N	31E	2750	21C09ad	14	WN	8E	4250					
Rainy Pass	20A16a	3	34N	17E	3730	18B3M	32	27N	31E	2750	18B3M	32	27N	31E	2750	21C09ae	14	WN	8E	4250					
Safety Harbor	20A9	21	35N	17E	4780	18B3M	32	27N	31E	2750	18B3M	32	27N	31E	2750	21C09af	14	WN	8E	4250					
War Creek Pass	20A30a	32	31N	20E	6300	18B3M	32	27N	31E	2750	18B3M	32	27N	31E	2750	21C09ag	14	WN	8E	4250					
Entiat River																				Skagit River					
Strief	20B19	34	28N	19E	1600	Crab Creek				Snoqualmie River											Skagit River				
Entiat Meadows	20A33a	28	31N	17E	4800	18B3M	32	27N	31E	2750	18B3M	32	27N	31E	2750	21C09ah	14	WN	8E	4250					
Entiat River Trail	20A34a	2	29N	17E	3150	18B3M	32	27N	31E	2750	18B3M	32	27N	31E	2750	21C09ai	14	WN	8E	4250					
Fox Camp	20A36a	17	30N	18E	6510	18B3M	32	27N	31E	2750	18B3M	32	27N	31E	2750	21C09aj	14	WN	8E	4250					
Pope Ridge	20B20	22	29N	18E	4300	18B3M	32	27N	31E	2750	18B3M	32	27N	31E	2750	21C09ak	14	WN	8E	4250					
Pugh Ridge	20A32a	34	30N	18E	6400	18B3M	32	27N	31E	2750	18B3M	32	27N	31E	2750	21C09al	14	WN	8E	4250					
Snow Brushy	20A35a	21	30N	17E	3850	18B3M	32	27N	31E	2750	18B3M	32	27N	31E	2750	21C09am	14	WN	8E	4250					
Tommy Creek	20B21a	10	28N	18E	5300	18B3M	32	27N	31E	2750	18B3M	32	27N	31E	2750	21C09an	14	WN	8E	4250					
Wenatchee River																				Skagit River					
Berne-Mill Creek	21B23	7	26N	15E	2925	Crab Creek				Snoqualmie River											Skagit River				
Berne-Mill Creek (New)	21B41SP	13	26N	14E	3240	18B3M	32	27N	31E	2750	18B3M	32	27N	31E	2750	21C09ao	14	WN	8E	4250					
Blewett Pass No. 2	20B2	35	22N	17E	4270	18B3M	32	27N	31E	2750	18B3M	32	27N	31E	2750	21C09ap	14	WN	8E	4250					
Chinukum G. S.	20B36	4	25N	17E	1810	18B3M	32	27N	31E	2750	18B3M	32	27N	31E	2750	21C09aq	14	WN	8E	4250					
Lake Wenatchee	20B5	33	27N	17E	1970	18B3M	32	27N	31E	2750	18B3M	32	27N	31E	2750	21C09ar	14	WN	8E	4250					
Leavenworth R. S.	20B17	1	24N	17E	1127	18B3M	32	27N	31E	2750	18B3M	32	27N	31E	2750	21C09as	14	WN	8E	4250					
Merritt	20B18	4	26N	16E	2140	18B3M	32	27N	31E	2750	18B3M	32	27N	31E	2750	21C09at	14	WN	8E	4250					
Stevens Pass	21B1	14	26N	13E	4070	18B3M	32	27N	31E	2750	18B3M	32	27N	31E	2750	21C09au	14	WN	8E	4250					

WATER SUPPLY OUTLOOK

State of Washington

March 1, 1968

* * * * *

* There has been a general deterioration of the snow pack in most of *
* the watersheds in the State of Washington and tributary basins. As *
* a result of this the water supply outlook for irrigation and power *
* in the Columbia River Basin is not as good as was reported last *
* month. Snow surveys made in the State and adjacent areas indicate *
* that the snow pack now ranges from 12% above normal to 87% below. *
* The watersheds in the central portion of the State flowing east *
* from the Cascades have improved slightly with respect to that *
* which was reported last month. Every other watershed in the State *
* has deteriorated and some of this deterioration is very drastic. *
* As reported last month the snow courses at the extreme high eleva- *
* tions are near normal but those at the middle and lower elevations, *
* if there is any snow on them at all, are extremely subnormal. The *
* saving factor for the irrigation farmers is the amount of water in *
* the reservoirs in the State. The high flows of this past month as *
* well as the carry over from last year leave these reservoirs in *
* excellent condition. Even the power reservoirs have well above *
* normal amounts of water in storage with the exception of Franklin *
* D. Roosevelt Lake. Again this is the result of high flows during *
* February and previous months. The precipitation picture during *
* February ranges from above to below normal with the greatest in- *
* crease along the southwest slopes of the Cascades. This good pre- *
* cipitation picture will improve summer runoff by wetting the soils *
* earlier than normal and may be the saving factor because there is *
* no snow at many of these locations. As things stand now for the *
* water users the runoff should be fairly early with deficient flows *
* late in the summer months and very deficient in the fall and early *
* winter. *
* * * * *

SNOW COVER

As stated above all but four watersheds in the State of Washington have less snow measured as of March 1 than was measured on the first of last month. These four watersheds, namely: Methow, Chelan, Entiat, and Wenatchee, have improved but not to any great extent. The other snow courses, those that have deteriorated in snow cover, all show a marked decrease over that previously measured this year. A ten to 15 percent decrease is average while a 30 to 40 percent decrease is not uncommon. Some of the areas that have been measured for the last ten to 15 years have reported no snow on the snow courses for the first time since measurements began. There are abnormalities in this field as well as others. The low watershed Ahtanum Creek, tributary to the Yakima basin, has an increase of 24% over that which was reported last month. While this is primarily because of the addition of a high elevation snow course not measured last month, it still points out that even these figures can be changed in the next month or so. If the weather favors

a cold, wet March the snow cover picture will improve but if temperatures stay warm the snowpack will decrease even more.

RESERVOIRS

The total reservoir picture in the State of Washington is better than has been experienced in many years. Only Franklin D. Roosevelt Lake has less than normal amount of water in storage as of March 1 and this has been drawn down purposely to assist in the construction of the third power house at Grand Coulee Dam. Conconully Reservoir in the Okanogan watershed has 500 acre feet less than normal storage but no problems are expected to be felt in this area. All other reservoirs have well above normal amounts of water in storage, some as high as double. While this excellent reservoir picture looks good it is a result of early runoff and much of the water that is yet to flow in March and April will be lost to the water users of the State. Again, the weather is the deciding factor.

PRECIPITATION

As reported by the Weather Bureau, the precipitation for the winter months, November, December, January, and February, is still below normal at the valley stations. This deficiency is lessening in the case of the Pend Oreille - Spokane, in southeast Washington, in the Yakima, Wenatchee, Chelan drainages, and the southwest slopes of the Cascades. The deficiency is still being built up in the upper Columbia in Canada, in the northeastern portion of Washington, in the Methow - Okanogan, and the northwest slopes of the Cascades. The greatest deficiency, percentagewise, occurred on the upper Columbia River Basin in Canada while the greatest increase, percentagewise, was on the southwest slopes of the Cascade Mountains. Specifically, in the Yakima drainage, as reported by the Bureau of Reclamation, precipitation for the period since September 1, 1967 is 192.55 inches averaging 9.6% above normal. During February, 42.59 inches fell at the five reservoir sites which was 52.4% above normal.

SOIL MOISTURE

There has been a general increase in the amount of moisture measured in the soil as of the first of March. This is a normal condition due to the melting of the snow earlier than can be normally expected. All of the soil mantles still can hold much additional moisture with the exception of the Upper Wheeler station in the Stemilt Basin which is in a saturated condition.

STREAMFLOW

Forecasts of streamflow for the April-September period range from normal to near 50% below normal. Surprisingly enough, the higher forecasted flows are expected from the Columbia River in Canada as well as the Columbia portion of the Similkameen watershed. Under the

precipitation statement made above these areas were reported drier than normal. A detailed tabulation of streamflow forecasts can be found on the following pages and will not be repeated here. During the month of February flows of all rivers in the State of Washington were well above normal with the exception of the Walla Walla River. The greatest flows, percentagewise, occurred on the Wenatchee River with 132% above normal. Equally high was the Chelan River with 117% above normal flows.

STREAMFLOW FORECASTS - MARCH 1968

The following summarized runoff forecasts are based principally on mountain snow cover and on the assumption that precipitation and temperature will be near average from the present time to the end of the forecast period. Appreciable deviations from normal of temperature and/or precipitation will correspondingly modify these forecasts.

Basin, Stream and Station	Forecast Runoff 1968	Seasonal Streamflow in Thousands of Acre-Feet				
		% 15-Yr. Avg.	Fore- cast Period	Measured Runoff 1967 1966 1965		
						15-Yr. Avg. 1948-62
<u>COLUMBIA BASIN</u>						
<u>Columbia River System</u>						
Columbia River						
at Birchbank <u>1/</u>	43680	97	Apr-Sep	45563	43275	45027
	34400	97	Apr-Jul	35808	32967	35517
	24600	98	Apr-Jun	24863	23221	24982
Columbia River						
at Grand Coulee <u>1/</u>	64630	92	Apr-Sep	62404	69626	70253
	54500	92	Apr-Jul	51602	56879	58921
	41600	91	Apr-Jun	38739	44465	45486
Columbia River						
bl Rock Island Dam <u>1/</u>	70350	91	Apr-Sep	67973	74986	77313
	58400	90	Apr-Jul	56575	61759	64967
	45500	91	Apr-Jun	42757	48045	50178
Columbia River						
at The Dalles, Ore. <u>1/</u>	95650	88	Apr-Sep	86923	112902	108696
	82000	89	Apr-Jul	72261	95012	92527
	66850	90	Apr-Jun	56465	76940	74281
<u>Pend Oreille River System</u>						
Pend Oreille River						
bl. Box Canyon	14880	88	Apr-Sep	13761	19515	16905
	13600	87	Apr-Jul	12783	17601	15571
	11450	85	Apr-Jun	11059	15299	13399
<u>Kettle River System</u>						
Kettle River						
nr. Laurier	1900	93	Apr-Sep	1380	1852	2051
	1810	93	Apr-Jul	1326	1759	1952
	1650	93	Apr-Jun	1172	1657	1774

1/ Observed flow corrected for storage in any of the following reservoirs which are above the station: Kootenay Lake, Hungry Horse, Flathead Lake, Pend Oreille Lake, F. D. Roosevelt Lake, Lake Chelan, Coeur d'Alene Lake, Brownlee, Noxon Reservoir and pumpage at F. D. Roosevelt Lake.

Streamflow Forecasts - March 1968 (Cont.)

Basin, Stream and Station	Forecast Runoff 1968	Seasonal Streamflow in Thousands of Acre-Feet				
		% 15-Yr. Avg.	Fore- cast Period	Measured 1967	Runoff 1966	15-Yr. Avg. 1948-62

Kettle River System (Cont.)

Colville River						
at Kettle Falls	131	70	Apr-Sep		80	166
	121	70	Apr-Jul		73	154
	112	70	Apr-Jun		67	146

Spokane River System *

Spokane River						
at Post Falls, Ida <u>2/</u>	2500	73	Apr-Sep		2513	3345
	2420	73	Apr-Jul		2456	3210
	2320	73	Apr-Jun		2365	3067

Okanogan River System **

Similkameen River						
nr. Nighthawk	1630	98	Apr-Sep		975	1356
	1530	99	Apr-Jul		912	1260
	1340	101	Apr-Jun		773	1114
Okanogan River						
at Oroville <u>3/</u>	445	90	Apr-Sep		191	447
	440	89	Apr-Jul		208	441
	430	91	Apr-Jun		193	439
Okanogan River						
nr. Tonasket	1860	95	Apr-Sep		1046	1614
	1690	95	Apr-Jul		957	1474
	1450	97	Apr-Jun		804	1300

Methow River System **

Methow River						
nr. Pateros	1130	96	Apr-Sep		661	817
	1050	96	Apr-Jul		610	740
	905	96	Apr-Jun		515	639

Chelan River System

Chelan River						
at Chelan <u>4/</u>	1310	97	Apr-Sep		987	1149
	1180	98	Apr-Jul		874	1012
	940	99	Apr-Jun		686	792

* Forecasts made by Morlan W. Nelson and J. Alden Wilson, Soil Conservation Service, Boise, Idaho.

** These forecasts are based in part upon base flow data especially prepared and furnished for this purpose by the U. S. Geological Survey.

2/ Observed flow corrected for storage in Coeur d'Alene Lake and diversions by Spokane Valley Farms Company and Rathdrum Prairie Canals.

3/ Observed flow corrected for storage and diversions.

4/ Observed flow corrected for storage in Lake Chelan.

Streamflow Forecasts - March 1968 (Cont.)

Basin, Stream and Station	Forecast Runoff 1968	Seasonal Streamflow in Thousands of Acre-Feet				
		% 15-Yr. Avg.	Fore- cast Period	Measured Runoff		
				1967	1966	1965
						15-Yr. Avg. 1948-62
<u>Chelan River System (Cont.)</u>						
Stehekin River						
at Stehekin	885	94	Apr-Sep	746	826	943
	765	94	Apr-Jul	637	701	810
	600	97	Apr-Jun	493	536	617
<u>Wenatchee River System</u>						
Wenatchee River						
at Plain	1155	83	Apr-Sep	1091	1308	1397
	1050	83	Apr-Jul	999	1189	1267
	860	85	Apr-Jun	816	975	1013
Wenatchee River						
at Peshastin	1550	81	Apr-Sep	1493	1747	1924
	1430	81	Apr-Jul	1379	1604	1758
	1180	83	Apr-Jun	1131	1328	1415
Stemilt Basin						
nr. Wenatchee	110*		May-Sep	132*	132*	--
<u>Yakima River System</u>						
Yakima River						
nr. Martin <u>5/</u>	114	72	Apr-Sep	129	133	158
	105	72	Apr-Jul	125	126	146
	95	76	Apr-Jun	113	115	126
Yakima River						
at Cle Elum <u>6/</u>	670	64	Apr-Sep	855	921	1046
	620	64	Apr-Jul	789	851	962
	550	66	Apr-Jun	702	756	834
Yakima River						
nr. Parker <u>7/</u>	1250	62	Apr-Sep	1418	1653	2016
	1240	62	Apr-Jul	1434	1643	1988
	1210	66	Apr-Jun	1336	1571	1826
Kachess River						
nr. Easton <u>8/</u>	106	75	Apr-Sep	109	117	141
	101	75	Apr-Jul	107	112	134
	93	79	Apr-Jun	99	104	118

* Thousands of Miners' Inches.

5/ Observed flow corrected for storage in Lake Keechelus.

6/ Observed flow corrected for storage in Keechelus, Kachess and Cle Elum Lakes and diversion by Kittitas Canal.

7/ Observed flow corrected for storage in Keechelus, Kachess, Cle Elum, Bumping and Rimrock Lakes and diversions by Roza, Union Gap, New Reservation, Old Reservation and Sunnyside Canals.

8/ Observed flow corrected for storage in Lake Kachess.

Streamflow Forecasts - March 1968 (Cont.)

Streamflow Forecasts March 1968		Seasonal Streamflow in Thousands of Acre-Feet (Cont.)					
Basin, Stream and Station	Forecast Runoff 1968	% 15-Yr. Avg.	Fore-cast Period	Measured Runoff 1967	1966	1965	15-Yr Avg. 1948-62
<u>Yakima River System (Cont)</u>							
Cle Elum River							
nr. Roslyn <u>9/</u>	385	73	Apr-Sep		413	448	525
	360	75	Apr-Jul		391	418	483
	310	76	Apr-Jun		338	367	407
Bumping River							
nr. Nile <u>10/</u>	120	74	Apr-Sep		126	140	163
	111	74	Apr-Jul		117	131	151
	96	77	Apr-Jun		102	115	124
American River							
nr. Nile	105	75	Apr-Sep		113	121	140
	98	75	Apr-Jul		106	113	130
	85	79	Apr-Jun		90	100	108
Tieton River							
at Tieton Dam <u>11/</u>	205	73	Apr-Sep		197	236	280
	175	73	Apr-Jul		177	205	241
	143	74	Apr-Jun		148	175	193
Naches River							
nr. Naches <u>12/</u>	684	69	Apr-Sep		769	888	991
	625	69	Apr-Jul		707	814	908
	545	70	Apr-Jun		621	719	776
Ahtanum Creeks							
nr. Tampico <u>13/</u>	48	87	Apr-Sep		39	44	55
	44	86	Apr-Jul		36	40	51
	40	89	Apr-Jun		32	36	45
<u>Lower Columbia River System</u>							
Mill Creek							
nr. Walla Walla	21	62	Apr-Sep		23	27	34
	18	60	Apr-Jul		20	23	30
	16	59	Apr-Jun		18	21	27
Lewis River							
at Ariel <u>14/</u>	1500	90	Mar-Jul			1191	1663
	1260	87	Apr-Sep		1371	1057	1450
	1110	86	Apr-Jul		1234	940	1386
	990	87	Apr-Jun		1081	854	1140

9/ Observed flow corrected for storage in Lake Cle Elum.

10/ Observed flow corrected for storage in Bumping Lake.

11/ Observed flow corrected for storage in Rimrock Lake.

12/ Observed flow corrected for storage in Bumping and Rimrock Lakes and diversions by Tieton, Selah Valley, Wapatox Canals and City of Yakima.

13/ Observed flow of North and South Forks (combined).

14/ Observed flow corrected for storage in Lake Merwin, Yale and Swift Reservoirs.

Streamflow Forecasts - March 1968 (Cont.)

Basin, Stream and Station	Forecast Runoff 1968	Seasonal Streamflow in Thousands of Acre-Feet					
		% 15-Yr. Avg.	Fore- cast Period	Measured Runoff			15-Yr Avg. 1948-62
				1967	1966	1965	

Lower Columbia River System (Cont.)

Cowlitz River							
at Castle Rock <u>15/</u>	2510	85	Apr-Sep		2691	2174	2954
	2210	84	Apr-Jul		2420	1901	2620
	1890	84	Apr-Jun		2056	1650	2244

OLYMPIC PENINSULA

Dungeness River System

Dungeness River							
nr. Sequim	140	79	Apr-Sep		173	130	178
	117	80	Apr-Jul		142	108	147
	89	80	Apr-Jun		105	84	111

15/ Observed flow corrected for storage in Mayfield Reservoir

COMPARISON OF SNOW COVER WITH THAT OF PREVIOUS YEARS

The following tabulation of Washington stream basins presents the water content of the snow about March 1, 1968 as per cent of the same date in 1967 and 1966 and average of record.

Tributary Basin	No. of Courses Average	Years of Record	1968 1967	Snow Water Expressed as per cent of 1966	Expressed 1948-1962 Avg.
<u>UPPER COLUMBIA BASIN</u>					
Pend Oreille	8 - 14	4 - 31	75	94	76
Kettle	17 - 21	5 - 30	100	104	99
Colville	5	10	134	73	79
Spokane	5 - 14	4 - 31	64	88	60
Okanogan	24 - 33	3 - 33	88	108	101
Methow	9 - 10	7 - 25	100	121	112
Chelan	6 - 7	4 - 18	87	117	92
Entiat	1 - 9	3 - 8	115	111	96
Wenatchee	19 - 20	7 - 23	81	69	66
Ahtanum	2	21 - 23	103	90	99
Yakima	26 - 32	7 - 48	66	61	57
<u>LOWER COLUMBIA</u>					
Klickitat	2	11	142	24	46
White Salmon	1	22	--	51	56
Lewis	14 - 16	5 - 23	56	45	64
Cowlitz	8 - 13	4 - 24	60	59	61
<u>PUGET SOUND</u>					
Nisqually	3 - 4	3 - 11	39	51	42
White	3 - 4	3 - 23	68	83	72
Green	6 - 11	6 - 22	33	35	27
Cedar	6	9 - 17	20	10	13
Snoqualmie	1 - 3	8 - 23	39	33	36
Skykomish	3	9 - 23	46	50	52
Skagit	13	11 - 21	86	103	86
Nooksack	2 - 6	11	67	75	69
<u>OLYMPIC PENINSULA</u>					
Skokomish	4 - 5	4 - 9	75	78	82
Elwha	1	14	61	79	66
Dungeness	1	19	68	73	68

RESERVOIR STORAGE - 1000 Acre Feet

BASIN or STREAM	RESERVOIR	USABLE ^{1/} CAPACITY	1968	Measured (March)		
				1967	1966	Normal*
<u>COLUMBIA</u>						
Spokane	Coeur d'Alene Lake	225.1	339.7	121.0	48.3	167.2
Columbia	Franklin D. Roosevelt Lake	5232.0	2353.4	3193.3	1730.0	3449.8
Columbia	Banks Lake ^{2/}	761.8	717.6	761.8	506.1	508.0
Okanogan	Conconully Reservoir	13.0	7.0	3.7	0.0	7.5
Okanogan	Salmon Lake	10.5	9.0	3.2	7.7	8.9
Chelan	lake Chelan	676.1	437.0	178.0	171.1	288.1
<u>YAKIMA</u>						
Yakima	Keechelus Lake	157.8	152.7	119.2	81.9	98.1
Kachess	Kachess Lake	239.0	234.2	198.3	167.9	178.1
Cle Elum	Lake Cle Elum	436.9	398.0	271.1	194.4	260.1
Bumping	Bumping Lake	33.7	28.0	4.8	3.1	11.1
Tieton	Rimrock Lake	198.0	176.4	111.2	84.5	121.1
<u>PUGET SOUND</u>						
Skagit	Ross Reservoir ^{2/}	1202.9	1227.6	1021.2	656.6	645.1
Skagit	Diablo Reservoir	90.6	84.2	83.4	86.4	82.1
Skagit	Gorge Reservoir	9.8	8.2	8.4	8.0	--

^{1/} Based on Active Storage

^{2/} Less than 15-year record in period 1948-62

* 15-year average 1948-62

SOIL MOISTURE - MARCH

Drainage Basin and Station	Number	Elev	Profile (Inches) :		Soil Moisture Content		
			Depth	Total Capacity :	(Inches) as of March 1		
					1968	1967	1966
<u>CRAB CREEK</u>							
Creston-Kunz	18B1m	2440	48	13.6	7.0	10.5	7.1
Jack Woods	18B3m	2600	48	13.6	9.9	9.8	7.8
Krause	18B4m	2440	48	13.6	6.6	9.0	7.5
Sheffels	18B5m	2360	48	13.6	9.9	8.2	6.2
Sherman	18B7m	2440	48	13.6	8.1	6.6	--
Wheatridge	18B6m	2200	48	13.6	8.2	9.3	7.4
<u>OKANOGAN</u>							
Salmon Meadows	19A2M	4500	48	5.4	2.9	3.2	2.1
Trout Creek	3-M	3600	48	7.3	Not Measured	3.4*	3.3*
<u>YAKIMA</u>							
Domery Flat	21B20m	2200	48	6.9	5.0	4.9	5.2
Lake Cle Elum	21B14M	2200	48	12.8	9.2	9.1	9.0
<u>WALLA WALLA</u>							
Couse	17C3m	3650	48	11.1	7.4	8.8	7.5
Helmerts	17C2M	4400	48	12.0	11.4	10.8	7.9
<u>WENATCHEE</u>							
Upper Wheeler	20B7M	4400	48	12.7	13.0	10.5	8.0

*February 1 measurement

FALL SOIL MOISTURE

Drainage Basin and Station	Number	Elev	Profile (Inches) :		Soil Moisture Content		
			Depth	Total Capacity :	(Inches) as of Oct. 1		
					1967	1966	1965
<u>CRAB CREEK</u>							
Creston-Kunz	18B1m	2440	48	13.6	4.6	5.0	4.9
Jack Woods	18B3m	2600	48	13.6	5.2	4.3	5.0
Krause	18B4m	2440	48	13.6	4.9	5.1	5.8
Sheffels	18B5m	2360	48	13.6	3.7	3.8	4.0
Sherman	18B7m	2440	48	13.6	3.6	3.7	--
Wheatridge	18B6m	2200	48	13.6	4.0	4.1	4.3
<u>OKANOGAN</u>							
Salmon Meadows	19A2M	4500	48	5.4	1.5	3.0	1.9
Trout Creek	3-M	3600	48	7.3	4.0	3.8	4.1
<u>YAKIMA</u>							
Domery Flat	21B20m	2200	48	6.9	4.8	2.4	1.9
Lake Cle Elum	21B14M	2200	48	12.8	9.1	6.4	6.9
<u>WALLA WALLA</u>							
Couse	17C3m	3650	48	11.1	5.4	5.7	6.0
Helmerts	17C2M	4400	48	12.0	6.7	6.7	6.2
<u>WENATCHEE</u>							
Upper Wheeler	20B7M	4400	48	12.7	5.6	5.7	6.2

PRECIPITATION ^{1/}

Division Averages and Departures

DRAINAGE DIVISIONS	FALL		WINTER	
	Sept-October Average	1967 ^{2/} Departure	Nov.-Dec. 1967 & Average	Jan. 1968 ^{2/} Departure
Columbia in Canada	3.98	- 1.57	8.97	- 2.16
Pend Oreille - Spokane	7.08	- 1.12	13.94	- 2.19
Northeastern Washington	3.93	- 0.89	8.21	- 1.31
Southeastern Washington	4.12	- 1.44	9.53	- 1.09
Central Washington	9.84	- 3.54	23.28	- 1.83
North Central Washington	2.96	- 0.08	5.28	- 0.80
Northwest Slope Cascades	20.36	- 3.27	42.96	- 1.67
Southwest Slope Cascades	12.74	- 6.02	30.78	- 4.35

Northeastern Washington	- Lower Spokane, Colville, Sanpoil and lower Kettle drainages.
Southeastern Washington	- Touchet, Tucannon and Palouse drainages.
Central Washington	- Yakima, Wenatchee and Chelan drainages.
North Central Washington	- Methow and Okanogan drainages.
Northwest Slope Cascades	- Puget Sound drainages.
Southwest Slope Cascades	- Lower Columbia drainages.

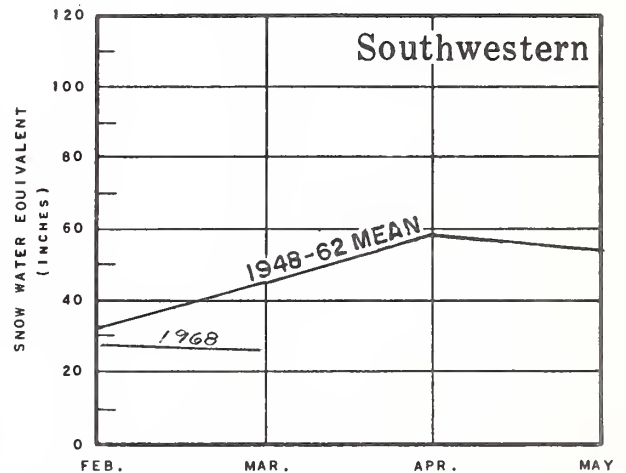
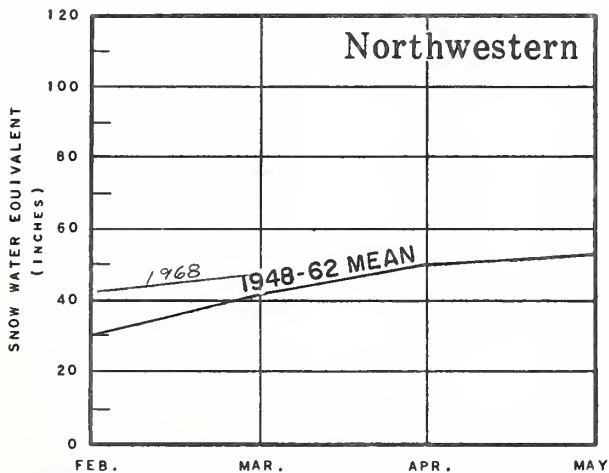
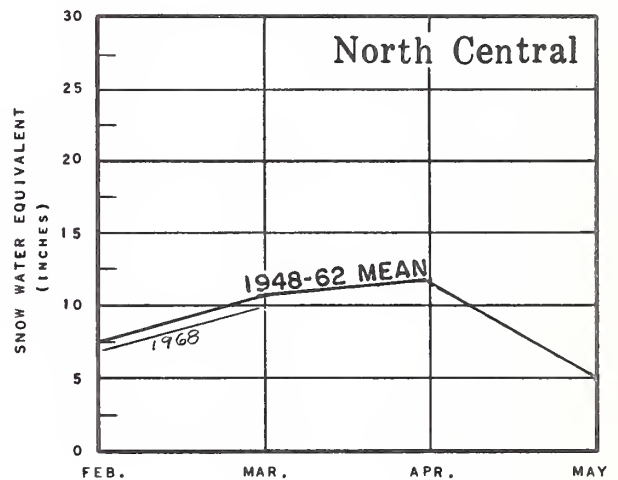
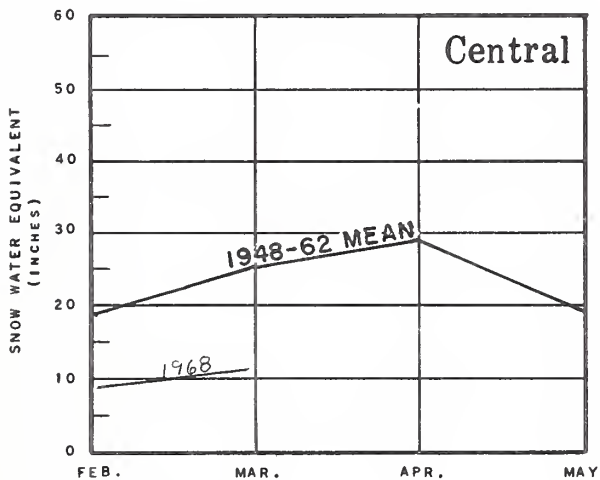
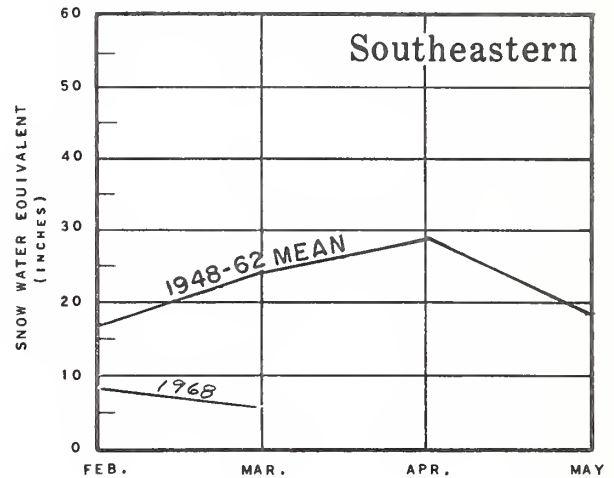
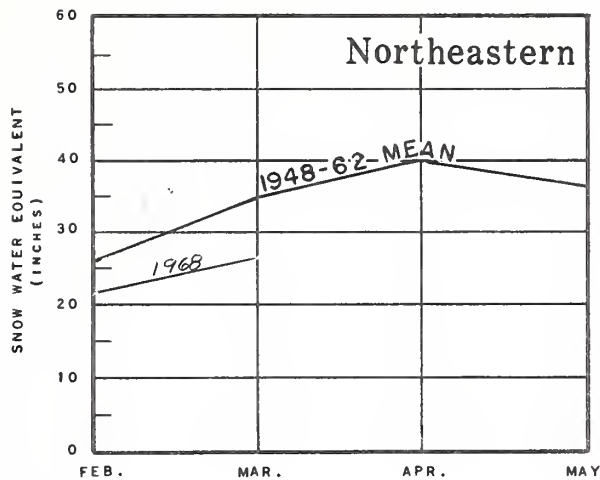
^{1/} - Preliminary analysis by U. S. Weather Bureau from data furnished by Meteorological Services of Canada and U. S. Weather Bureau.

^{2/} - Departure from 15-year (1948-62) drainage division average.

WASHINGTON SNOW COVER

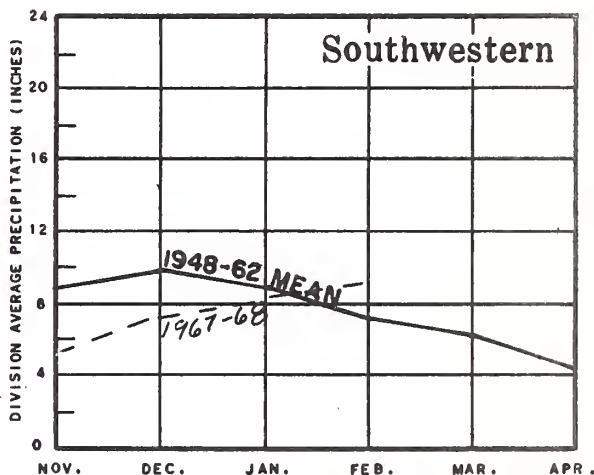
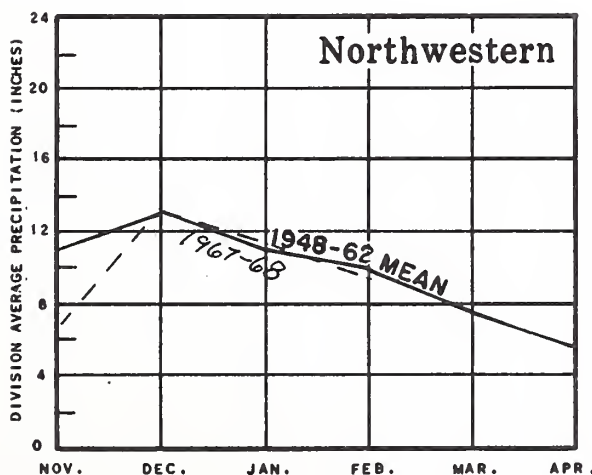
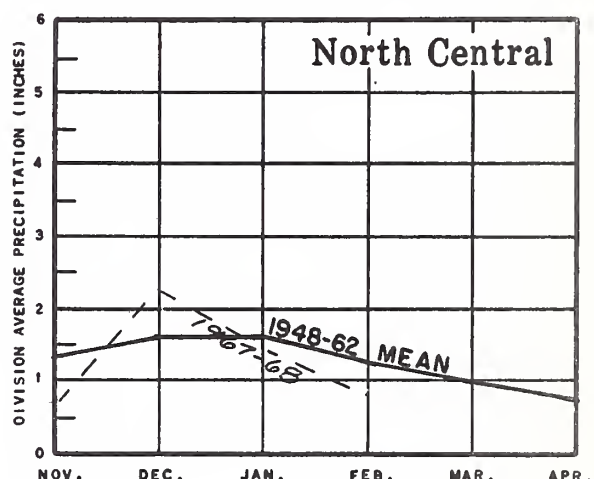
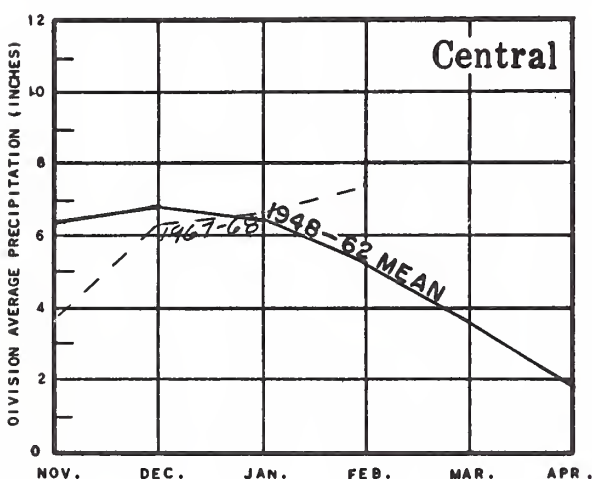
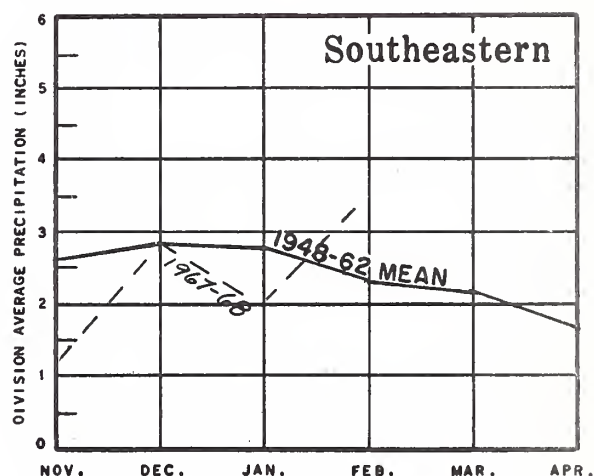
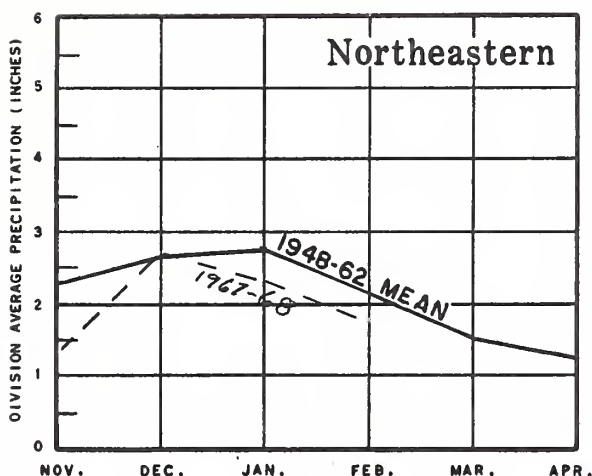
1968

DRAINAGE AREAS



1967-1968

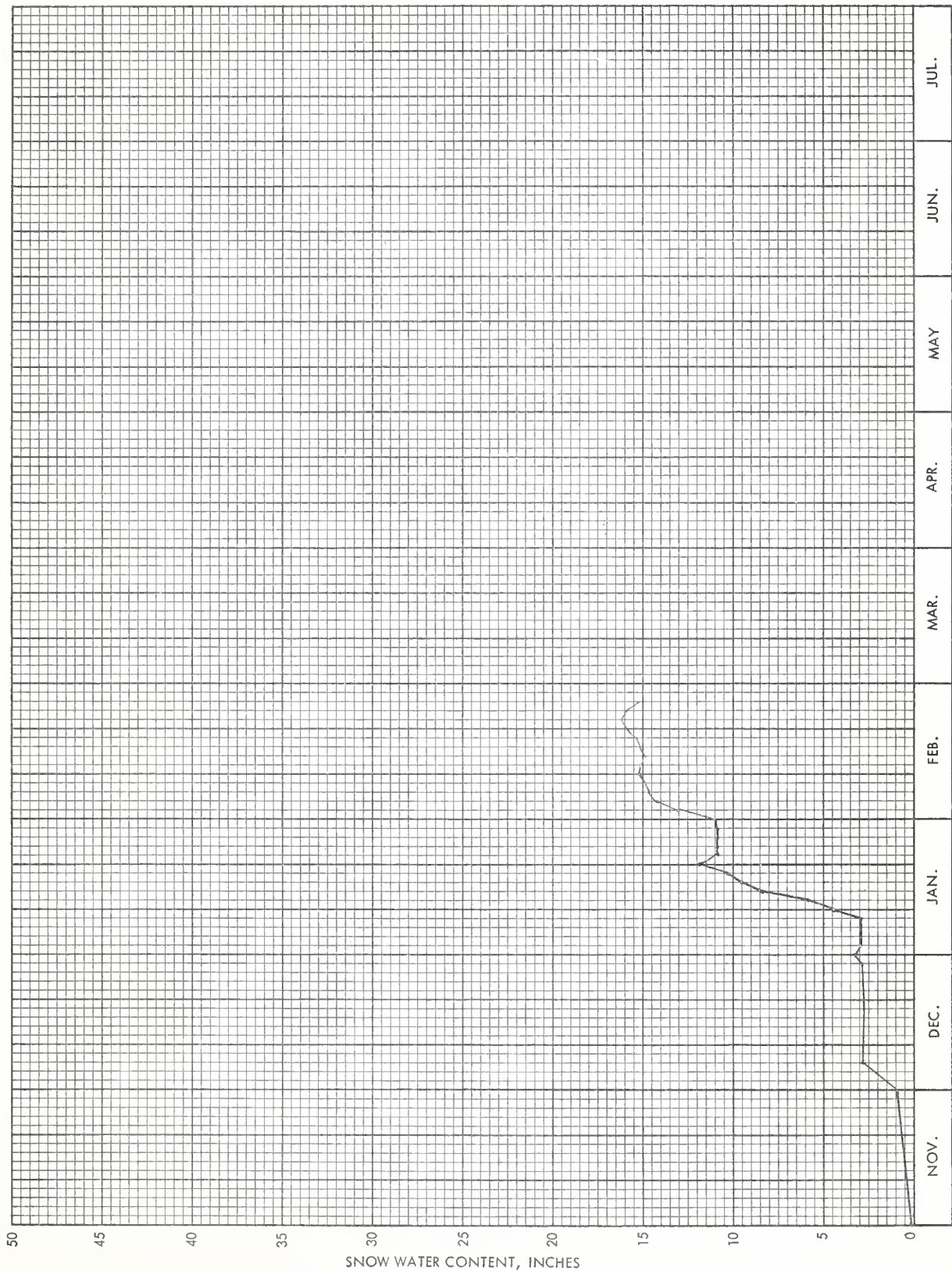
DRAINAGE AREAS



SNOW PILLOW DATA

Berne-Mill Creek

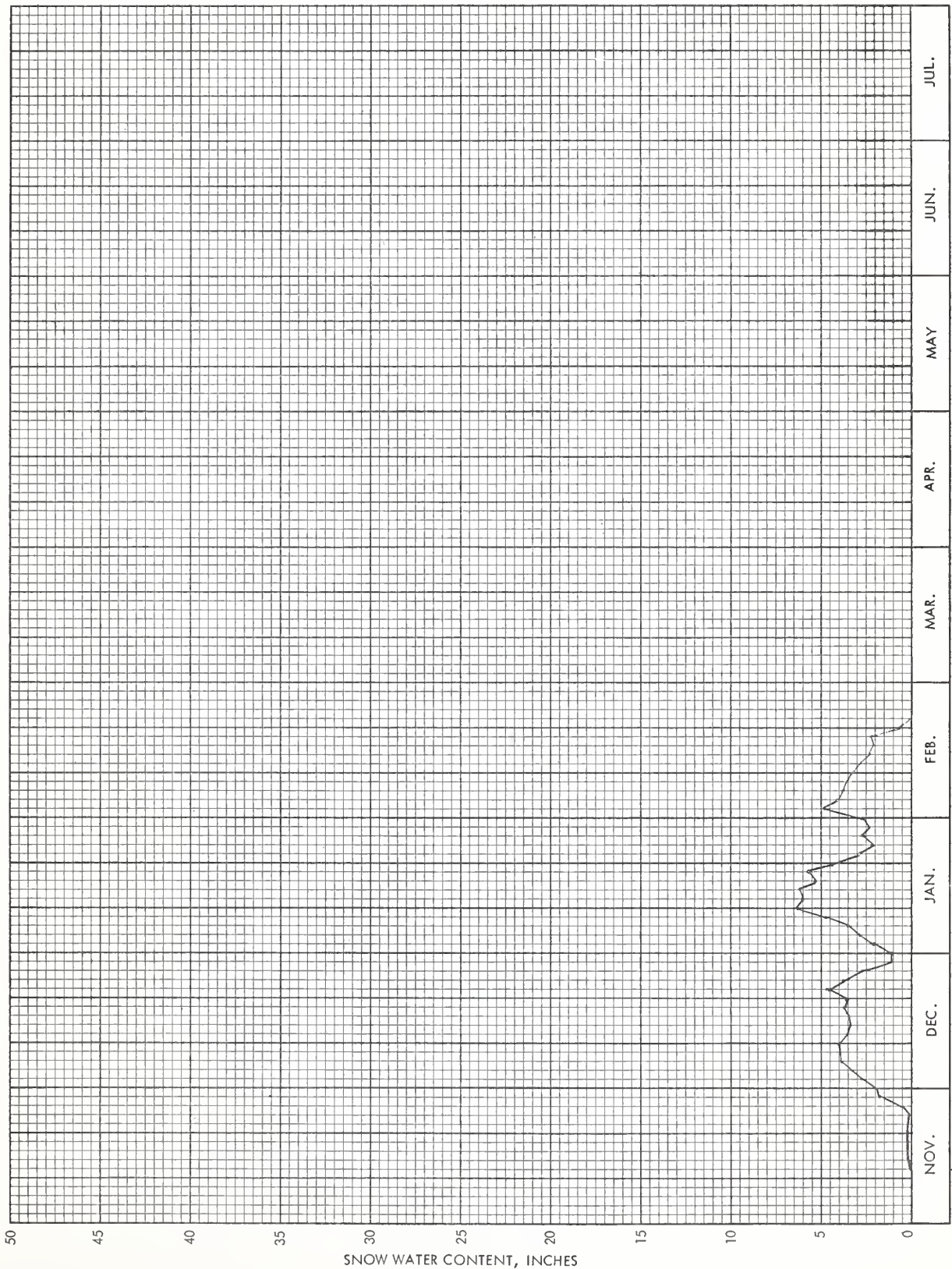
Sec. 13 T. 26N R. 14E No. 21B41SP Drainage: Wenatchee
 Lat. 47°46' Long. 121°01' Elev. 3170'



SNOW PILLOW DATA

Cougar Mountain - FS

Sec. 28 T. 21N R. 9E No. 21B42SP Drainage: Green River
 Lat. _____ Long. _____ Elev. 3200'

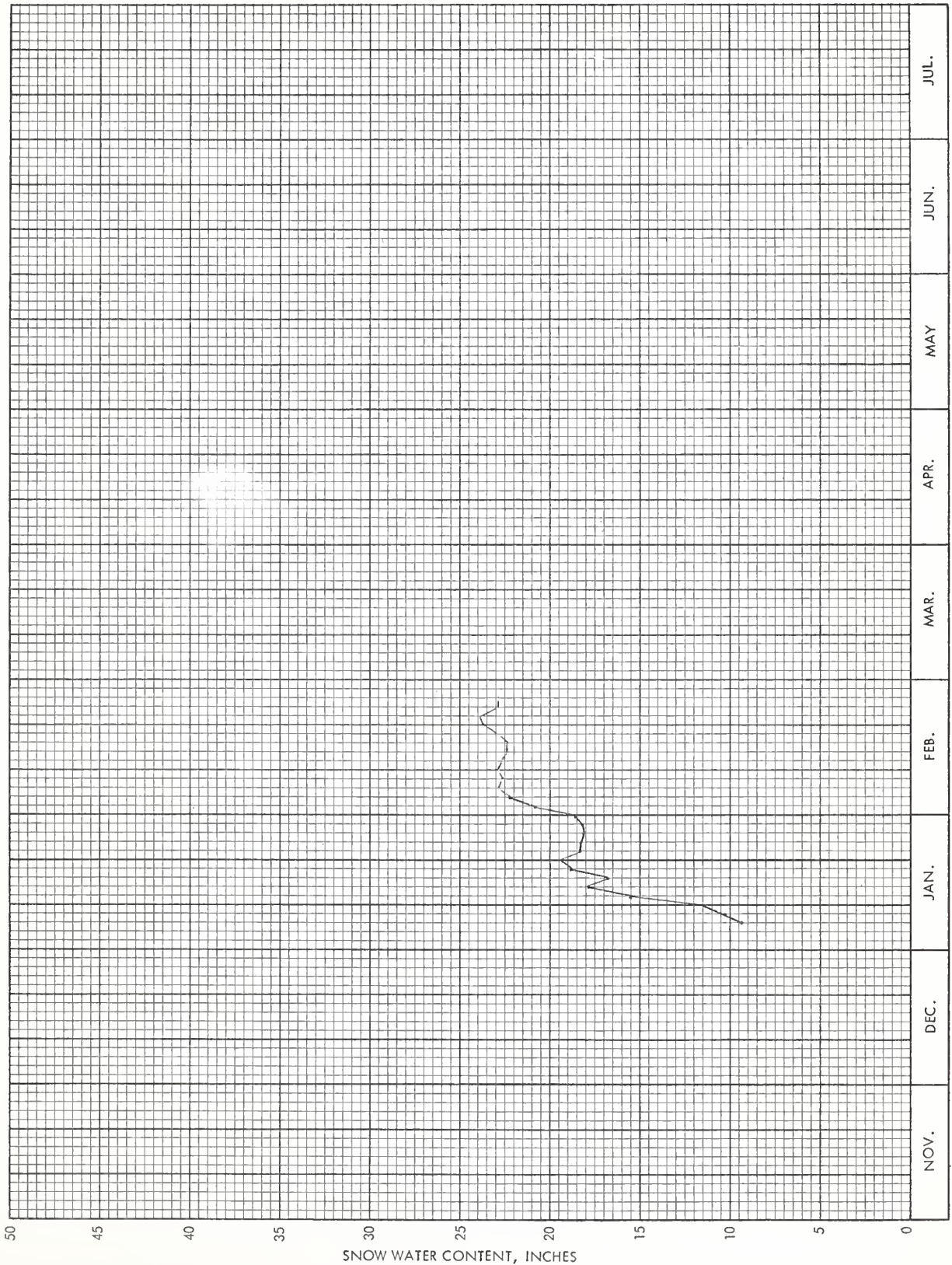


SNOW PILLOW DATA

Snowshoe Butte

Sec. 14 T. 20N R. 11E No. 21B43SP Drainage: Green River

Lat. _____ Long. _____ Elev. 5000'

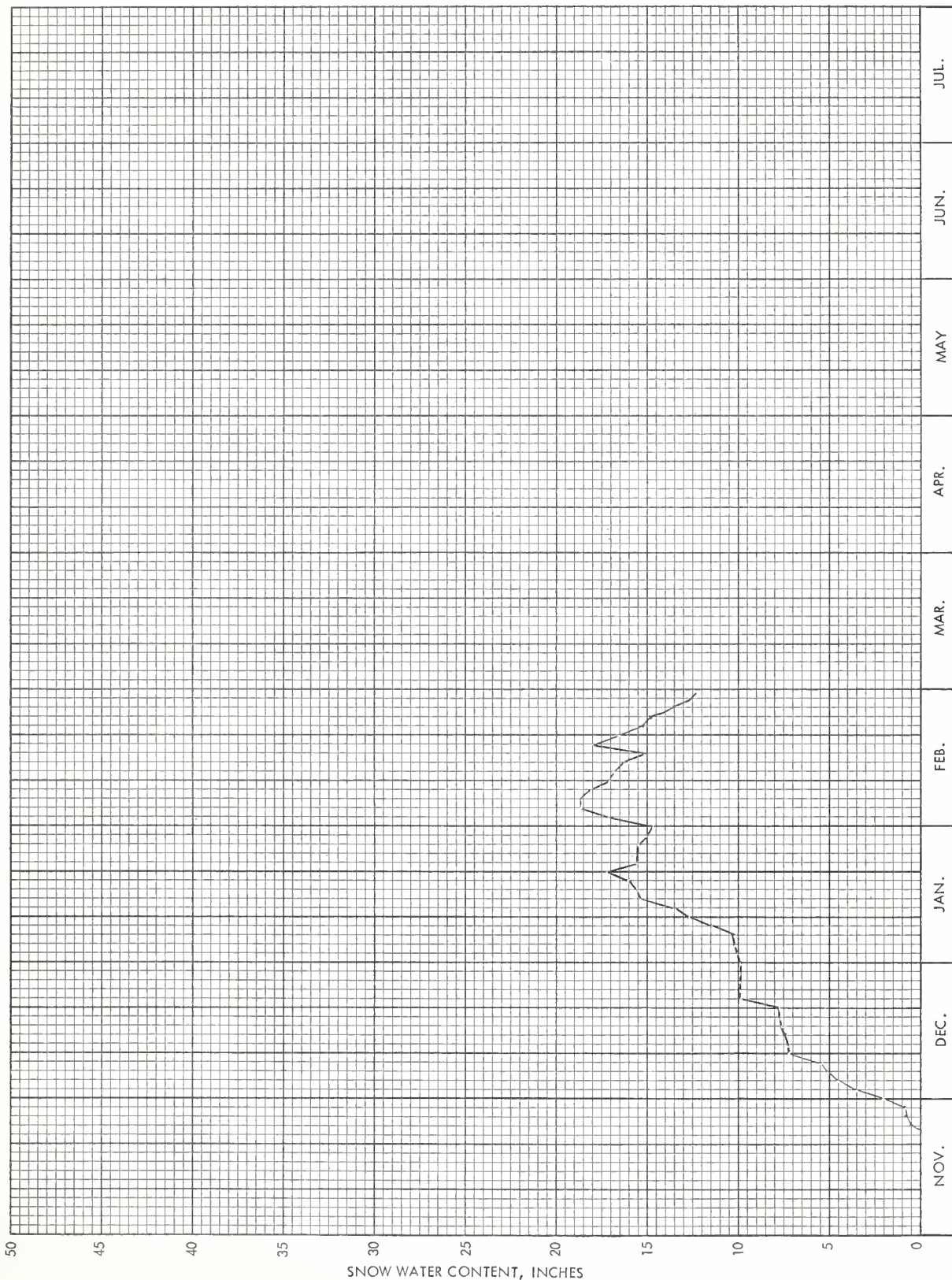


SNOW WATER CONTENT, INCHES

SNOW PILLOW DATA

EBA Pillow - Snoqualmie Pass

Sec. 4 T. 22N R. 11E No. 21B356P Drainage: Yakima
 Lat. 47°25' Long. 121°25' Elev. 3020'



SNOW DATA FEBRUARY 1 to MARCH 1, 1968

SNOW

DRAINAGE BASIN and SNOW COURSE			1968			PAST RECORD		
			Date of Survey	Snow Depth (in.)	Water Content (in.)	Water Content (in.)		
Name	No.	Elev.				1967	1966	1948-62 Avg.

U P P E R C O L U M B I A D R A I N A G E

PEND OREILLE RIVER

Baree Creek	15B11	5500	2/29	86	35.7	55.1	38.1	--
Baree Midway	15B16	4600	2/29	62	24.0	44.4	--	--
Benton Meadow	16A2	2344	2/27	15	4.7	2.9	7.7	6.5
Benton Spring	16A3	4900	2/27	36	13.0	20.6	15.9	20.2
Boyer Mountain	17A2	5250	2/26	56	21.2	22.8	21.8	25.3
Brush Creek	14A4	5000	2/28	20	7.4	13.4	10.6	12.7*
#Chewelah	17A4	4925	2/26	39	14.1	13.2	18.8	--
Hoodo Creek	15C1	6200	2/29	99	36.7	46.1	34.6	45.3*
Lookout	15B2	5250	2/28	70	26.9	35.6	27.1	34.8*
Mosquito Ridge +	16A4A	5100	2/27	84	32.2	47.1	33.3	--
Nelson	Canada	3050	2/29	38	12.2	14.6	15.2	16.2
Schweitzer Bowl	16A6	4500	2/27	66	25.5	33.0	25.7	--
Schweitzer Ridge	16A5	6100	2/27	99	37.5	47.8	34.8	--
Winchester Creek	17A3	2970	2/26	33	10.2	7.4	11.4	13.4*

KETTLE RIVER

Barnes Creek	Canada	5500	2/28	60	20.8	21.2	19.5	18.3**
Big White Mountain	Canada	5500	2/28	55	16.8	22.0	13.2	--
Boulder Road	18A2	1450	2/13	19	5.5	2.4	5.6	4.5*
			2/26	16	5.6	2.5	6.1	3.7*
Butte Creek	18A3	4070	2/13	30	8.1	8.9	6.8	8.5*
			2/26	28	7.8	7.6	8.0	9.1*
Cabin Creek	18A8	3170	2/13	27	6.5	7.5	5.6	7.5*
			2/26	24	7.9	6.5	6.7	7.7*
Carmi	Canada	4100	3/1	17	4.9	5.9	4.9	--
Farron	Canada	4000	2/28	31	10.3	13.1	12.0	13.2
Goat Creek	18A4	3595	2/13	20	5.9	6.4	5.7	6.9*
			2/26	17	6.2	5.4	6.6	6.6*
Lower Trapping Cr.	Canada	3050	2/28	9	3.4	5.2	4.4	--
#Monashee Pass	Canada	4500	2/28	42	14.3	14.2	13.9	13.2**
Snow Caps Creek	18A5	2150	2/13	20	5.2	1.7	4.7	4.6*
			2/26	15	5.8	1.8	4.2	4.2*
Snow Caps Trail	18A6	2720	2/13	22	6.1	4.4	5.6	6.1*
			2/26	18	6.1	3.9	5.5	6.1*
Summit G. S.	18A7	4600	2/13	25	6.6	8.1	6.3	8.0*
			2/26	25	6.7	7.4	7.2	8.3*
Upper Trapping Cr.	Canada	5500	2/28	26	6.2	11.2	7.2	--

- # Not located directly on this drainage
 * Adjusted 1948-62 average
 ** Average for years of record

APPENDIX 2

SNOW

DRAINAGE BASIN and SNOW COURSE			1968			PAST RECORD		
			Date of Survey	Snow Depth (in.)	Water Content (in.)	Water Content (in.)		
Name	No.	Elev.				1967	1966	1948-62 Avg.

COLVILLE RIVER

Baird	17A6	3215	2/29	10	3.8	4.8	7.2	7.0*
Carlson	18A9	2885	2/27	2	0.6	0.8	5.2	4.8*
Chewelah	17A4	4925	2/26	39	14.1	13.2	18.8	17.6*
Stranger Mountain	17A5	4990	2/28	31	11.9	8.0	14.2	13.2*
Togo	18A10	3370	2/27	31	11.2	4.3	11.5	10.1*

SPOKANE RIVER

Copper Ridge	16B2	4800	2/29	37	15.8	23.4	26.0	27.8
Forty-nine Meadows	15B3	5000	2/28	51	20.9	31.0	26.2	32.1*
Fourth of July Summit	16B3	3100	2/28	0	0.0	7.6	11.0	11.0*
Granite Peak	15B13A	6000	2/28	98	37.8	48.2	35.4	--
Kellogg Peak +	16B5A	5560	2/27	60	23.0	28.6	28.6	--
#Lookout	15B2	5250	2/28	70	26.9	35.6	27.1	34.8*
Lost Lake	15B14A	6000	2/28	105	45.2	62.1	43.0	--
Lower Sands Creek	16B1	3400	2/29	30	11.0	15.2	17.4	19.1*
Medicine Ridge	15B4A	6150	2/28	105	39.0	45.8	35.8	--
#Mosquito Ridge+	16A4A	5110	2/27	84	32.3	47.1	33.3	--
Outlaw Creek	15B12A	3750	2/28	28	11.7	14.0	15.2	--
Roland Summit +	15B5A	5200	2/27	61	23.4	31.4	26.5	--
Sherwin	16C1	3200	3/1	16	5.4	12.0	13.4	--
Sunset +	15B9A	5600	2/27	90	34.6	40.2	33.3	--

OKANOGAN RIVER

Aberdeen Lake	Canada	4300	3/1	19	5.8	5.2	7.4	6.0**
Blackwall Mountain	Canada	6250	2/27	92	34.9	37.2	29.7	30.9**
Bouleau Creek	Canada	5000	2/25	40	11.3	11.5	--	9.9**
Brookmere	Canada	3200	2/27	24	7.8	9.6	7.8	9.6
Carrs Lanking #1	Canada	2250	2/24	0	0.0	0.0	--	--
Carrs Landing #2	Canada	3200	2/24	11	3.0	3.6	--	--
Clark +	19A8a	7000	Not Measured			--	--	--
Copper Mountain	Canada	4300	2/24	5	2.2	5.1	5.5	6.0**
Enderby	Canada	6250	2/27	103	33.0	38.2	28.7	--
#Freezeout Meadows	20A2	5000	2/27	70	27.0	29.2	31.0	29.7*
Hamilton Hill	Canada	4900	2/25	40	13.2	17.4	14.2	13.2**
#Harts Pass	20A5A	6500	2/26	122	45.3	40.4	30.9	41.6*
#Horseshoe Basin +	19A5a	7000	2/26	51	17.3	17.3	15.5	--
Isintok Lake	Canada	5510	2/26	22	6.2	9.2	5.7	--
Lost Horse Mountain	Canada	6300	3/1	32	9.7	10.2	5.1	7.7**
#Loup Loup	19A7	4650	2/27	27	9.1	7.5	7.0	--

+ Now water equivalent estimated from aerial stadia observation

Not located directly on this drainage

* Adjusted 1948-62 average

** Average for years of record

APPENDIX 3

SNOW

DRAINAGE BASIN and SNOW COURSE			1968			PAST RECORD		
			Date of Survey	Snow Depth (in.)	Water Content (in.)	Water Content (in.)		
Name	No.	Elev.				1967	1966	1948-62 Avg.

OKANOGAN RIVER (Cont.)

Lower Esperon Creek	Canada	4270	Not Measured			11.6	9.0	--
McCulloch	Canada	4200	2/28	20	5.1	6.7	6.0	6.4
Middle Esperon Creek	Canada	4580	Not Measured			14.4	11.0	--
Missezula Mountain	Canada	5100	2/27	31	7.9	10.1	8.7	9.1**
Mission Creek	Canada	6000	2/27	60	19.3	21.0	14.7	16.5**
Monashee Pass	Canada	4500	2/28	42	14.3	14.2	13.9	13.2**
Mount Kobau	Canada	5950	2/24	39	11.0	13.5	10.0	--
Muckamuck +	19A9a	6390	Not Measured			--	--	--
Mutton Creek No. 1	19A1	5700	2/26	36	11.6	16.5	11.0	13.3*
Mutton Creek No. 2	19A4	6000	2/26	40	12.1	17.4	11.1	13.9*
New Copper Mountain	Canada	4300	2/23	9	3.6	5.9	5.6	5.5**
New Penticton Res.	Canada	5225	2/26	30	7.1	--	--	--
Nickel Plate Mountain	Canada	6200	3/1	20	6.0	10.2	5.3	6.7**
Paysayten +	20A28a	4300	2/26	35	11.9	22.1	17.0	15.1*
Postill Lake	Canada	4500	2/28	26	7.6	8.0	7.8	7.3**
#Quartette Lake	Canada	4000	Not Measured			10.7	--	--
Rusty Creek	19A3	4000	2/26	22	6.7	6.5	6.6	7.9
Salmon Meadows	19A2	4500	2/26	34	9.9	10.8	7.8	10.8*
Silver Star Mountain	Canada	6050	3/2	74	28.8	29.5	23.5	21.2**
Starvation Mountain +	19A10a	6750	Not Measured			--	--	--
Summerland Reservoir	Canada	4200	2/25	29	8.0	11.2	8.4	--
Touts Coulee	19A6	2845	2/28	8	2.6	0.0	4.2	--
Trout Creek	Canada	4700	2/24	22	5.6	8.1	6.4	7.0
Upper Esperon Creek	Canada	5290	Not Measured			19.2	14.5	--
White Rocks Mountain	Canada	6000	2/29	62	22.8	24.8	18.1	17.5**

METHOW RIVER

Billy Goat Pass +	20A10a	6409	2/26	94	32.0	33.7	30.0	19.7*
Dollar Watch +	20A29a	7000	2/26	87	29.6	24.5	25.2	25.3*
Harts Pass	20A5A	6500	2/26	122	45.3	40.4	30.9	41.6*
Horseshoe Basin +	19A5a	7000	2/26	51	17.3	17.3	15.5	12.6*
Loup Loup	19A7	4650	2/27	27	9.1	7.5	7.0	9.9*
#Mutton Creek No. 1	19A1	5700	2/26	36	11.6	16.5	11.0	13.3*
#Mutton Creek No. 2	19A4	6000	2/26	40	12.1	17.4	11.1	13.9*
#Rusty Creek	19A3	4000	2/26	22	6.7	6.5	6.6	7.9
#Salmon Meadows	19A2	4500	2/26	34	9.9	10.8	7.8	10.8*
#War Creek Pass +	20A31a	6500	2/26	117	43.3	41.8	33.6	--

+ Snow water equivalent estimated from aerial stadia observations

Not located directly on this drainage

* Adjusted 1948-62 average

** Average for years of record

APPENDIX 4

SNOW

DRAINAGE BASIN and SNOW COURSE			1968			PAST RECORD		
			Date of Survey	Snow Depth (in.)	Water Content (in.)	Water Content (in.)		
Name	No.	Elev.				1967	1966	1948-62 Avg.

CHELAN LAKE BASIN

Cloudy Pass +	20A22a	6500	2/26	108	40.0	41.8	32.2	38.2*
Greenwood Flat +	20A25a	3540	Not measured			--	14.7	24.5*
Little Meadows +	20A24a	5275	2/26	91	33.7	46.2	30.8	41.0*
Lyman Lake +	20A23A	5900	Not measured			58.5	64.0	53.0*
Park Creek Flat +	20A13a	2220	2/26	80	29.6	29.9	30.8	32.0*
Park Creek Ridge +	20A12A	4600	2/26	102	37.7	47.6	35.7	43.7*
Petersons +	20A16a	3730	2/26	84	31.1	37.7	25.2	33.3*
Rainy Pass	20A9	4780	2/26	102	37.6	44.4	28.0	39.4*
Safety Harbor	20A30A	6300	Not Measured			24.3	30.1	--
War Creek Pass +	20A31a	6500	2/26	117	43.3	41.8	33.6	--

ENTIAT RIVER

Brief	20B19	1600	2/25	18	6.9	2.1	7.9	7.2*
Entiat Meadows +	20A33a	4800	2/29	128	49.0	48.0	--	--
Entiat River Trail +	20A34a	3150	2/29	50	18.8	17.6	23.1	--
Fox Camp +	20A36a	6510	2/29	172	64.5	49.3	--	--
Pope Ridge	20B20	4300	2/13	41	13.0	13.5	--	--
			2/29	36	13.4	16.0	15.5	--
Pope Ridge S. P.	20B24SP	4300	2/13	--	12.4	--	--	--
			2/29	--	12.8	--	--	--
Pugh Ridge +	20A32a	6400	2/29	99	37.1	26.7	24.1	--
Snow Brushy +	20A35a	3850	2/29	109	40.9	35.5	33.6	--
Tommy Creek +	20B21a	5300	2/29	66	24.8	25.7	24.1	--

WENATCHEE RIVER

Berne-Mill Creek	21B23	2925	2/15	50	16.7	23.9	21.3	24.2*
			2/27	44	15.5	23.6	22.6	27.1*
Berne-Mill Creek New	21B41SP	3240	2/27	29	8.9	22.6	--	--
Blewett Pass No. 2	20B2	4270	3/4	17	8.5	11.0	15.6	16.3*
Chiwaukum G. S.	20B16	1810	2/15	30	8.3	7.3	10.4	12.0*
			2/27	28	8.2	7.4	11.5	11.9*
#Fish Lake	21B4	3371	2/29	55	20.6	29.4	27.0	35.1*
Lake Wenatchee	20B5	1970	2/15	31	10.1	10.2	13.1	14.7*
			2/27	29	9.9	11.1	14.3	15.2*
Leavenworth R. S.	20B17	1127	2/14	15	5.0	0.0	8.4	4.8*
			3/1	4	1.7	0.0	6.5	3.0*
#Lyman Lake	20A23A	5900	Not measured			58.5	64.0	53.0*

+ Snow water equivalent estimated from aerial stadia observations

Not located directly on this drainage

* Adjusted 1948-62 average

** Average for years of record

APPENDIX 5

SNOW

DRAINAGE BASIN and SNOW COURSE			1968			PAST RECORD		
			Date of Survey	Snow Depth (in.)	Water Content (in.)	Water Content (in.)		
Name	No.	Elev.				1967	1966	1948-62 Avg.

WENATCHEE RIVER (Cont.)

Merritt	20B18	2140	2/15	31	10.5	9.3	14.4	16.6*
			2/27	29	9.8	9.4	16.1	15.6*
Stevens Pass (South)	21B1	4070	2/15	66	23.8	46.6	38.2	41.4*
			2/27	63	24.2	50.3	41.4	45.9
Stevens Pass Sand Shed	21B45	3700	2/15	45	18.2	New Course		
			2/27	39	17.2			

CLOCKUM CREEK

Clockum Creek	20B22	5300	2/26	28	9.6	New Course		
Clockum Creek No. 2	20B23	4300	2/26	25	9.0	New Course		

SQUILCHUCK CREEK

Beehive Springs	20B3	4400	2/27	17	6.2	2.6	9.6	7.0*
Scout-A-Vista	20B4	3400	2/27	25	7.2	2.6	8.7	8.0*

STEMILT CREEK

Jump-Off	20B8	4450	2/26	23	9.2	2.4	10.6	7.7*
Stemilt Slide	20B6	5000	2/27	35	13.1	8.3	14.5	14.4*
Upper Wheeler	20B7	4400	2/27	23	9.7	2.6	10.9	9.6*

YAKIMA RIVER

#Ahtanum R. S.	21C11	3100	2/26	17	6.6	0.0	9.2	7.3*
Big Boulder Creek	21B9	3200	2/29	18	6.4	16.9	17.8	20.7*
#Blewett Pass No. 2	20B2	4270	3/4	17	8.5	11.0	15.6	16.3
Bumping Lake	21C8	3450	2/15	31	10.1	11.4	17.4	17.3*
			2/28	25	10.3	12.1	16.1	17.4
Bumping Lake New	21C36	3400	2/15	39	11.9	14.7	--	--
			2/28	35	12.8	15.9	--	--
#Cayuse Pass	21C6	5300	2/26	123	54.5	77.7	65.9	79.0*
Clockum Pass	20B9	5370	2/29	42	13.0	11.8	--	13.8*
Cooke Creek	20B10	4123	2/29	0	0.0	0.0	--	5.2*
#Corral Pass	21C13	6000	2/26	54	22.1	39.2	30.5	39.7*
Fish Lake	21B4	3371	2/29	55	20.6	29.4	27.0	35.1*
Green Lake	21C10	6000	2/26	68	27.5	33.2	28.8	27.3*
Grouse Camp	20B11	5385	2/28	35	12.5	11.3	18.6	18.2*
High Creek	20B12	2930	2/28	12	4.3	0.0	7.1	5.8*

Not located directly on this drainage

* Adjusted 1948-62 average

APPENDIX 6

SNOW

DRAINAGE BASIN and SNOW COURSE			1968			PAST RECORD		
			Date of Survey	Snow Depth (in.)	Water Content (in.)	Water Content (in.)		
Name	No.	Elev.				1967	1966	1948-62 Avg.

YAKIMA RIVER (Cont.) (See Appendix 11)

Lake Cle Elum	21B14M	2200	2/10	10	3.1	0.0	--	--
			Not Measured			2.2	--	--
			3/1	0	0.0	1.7	12.6	11.0
Manashtash	20C1	3935	2/28	7	2.4	0.0	5.1	4.7*
Morse Lake	21C17	5400	2/28	109	44.4	59.2	42.8	49.3*
Nanum	20B13	3875	2/28	22	8.5	5.0	13.2	11.7*
#Olallie Meadows	21B2	3625	2/21	39	18.0	--	--	--
			2/26	35	16.2	38.8	42.0	44.6
#Satus Pass	20D1	4030	2/28	0	0.0	4.6	15.3	7.8*
Snoqualmie Pass	21B33SP	3020	2/28	--	12.5	26.4	--	--
#Stampede Pass	21B10	3000	2/8	46	17.4	--	21.4	--
			2/15	43	18.1	--	--	--
			2/19	48	18.2	44.6	25.9	--
			2/29	36	14.9	39.9	29.0	43.4*
Trail Creek	20B14	3360	2/29	0	0.0	0.0	5.7	--
Tunnel Avenue	21B8	2450	2/10	36	11.3	9.7	--	--
			2/20	36	12.1	14.3	--	--
			3/1	28	10.7	14.2	21.6	25.1
Walters Flat	20B15	3360	2/28	16	6.4	0.0	9.4	7.9*
White Pass (E. Side)	21C28	4500	2/15	30	9.9	20.2	19.9	21.1*
			2/29	23	9.0	20.9	21.5	21.5*
White Pass (L. Lake)	21C27	4500	2/15	29	10.6	25.5	23.7	23.2*
			2/27	25	11.0	24.9	29.9	26.8*

AHTANUM CREEK

Ahtanum R. S.	21C11	3100	2/26	17	6.6	0.0	9.2	7.3*
#Green Lake	21C10	6000	2/26	68	27.5	33.2	28.8	27.3*

LOWER COLUMBIA DRAINAGE

ASOTIN CREEK

Spruce Springs	17C4	5700	2/26	39	16.2	18.2	20.3	--
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MILL CREEK

Homestead	17C1	4030	2/27	0	0.0	6.1	13.4	9.1*
Martin Springs	17C2	4400	2/27	0	0.0	9.8	16.8	14.2*
Walla Walla Diversion	18D13	2400	2/29	0	0.0	0.0	7.0	2.8*

Not located directly on this drainage

* Adjusted 1948-62 average

APPENDIX 7

SNOW

DRAINAGE BASIN and SNOW COURSE			1968			PAST RECORD		
			Date of Survey	Snow Depth (in.)	Water Content (in.)	Water Content (in.)		
Name	No.	Elev.				1967	1966	1948-62 Avg.

KLICKITAT RIVER

Satus Pass	20D1	4030	2/28	0	0.0	4.6	15.3	7.8*
West Fork Cabin	21C15	3000	2/28	19	7.4	0.6	15.9	8.4*

WHITE SALMON RIVER

Cultus Creek	21C12	4000	Not Measured			--	48.4	42.8*
#Surprise Lakes	21C13A	4250	2/26	56	25.3	--	49.6	44.8*

WIND RIVER

#Old Man Pass	21D19	3100	2/26	28	12.1	33.7	29.6	13.7*
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LEWIS RIVER

Blue Lake +	21C22a	4800	2/26	114	50.2	73.0	67.4	72.7*
Bob's Trail	21C21	2200	2/27	19	8.1	16.4	25.0	13.7
Calamity Ridge +	22D1a	2500	2/26	0	0.0	3.0	16.4	--
Council Pass +	21C18a	4200	2/26	48	21.1	40.3	43.0	34.2*
#Cultus Creek	21C12	4000	Not Measured			--	48.4	42.8
Divide Meadow +	21C29a	5600	2/26	77	34.6	49.6	45.5	51.2*
Grand Meadow	21C25	3500	2/26	34	14.4	23.5	30.4	24.6*
Lone Pine Shelter	21C26	3800	2/27	65	27.3	38.8	44.7	33.7*
Marble Mountain +	22C5a	3200	2/26	12	6.2	--	45.9	--
#Mosquito Meadows	21C19	4100	2/27	69	30.7	38.9	45.8	36.2*
New Muddy River	22C6	1400	2/26	0	0.0	0.0	20.1	--
Old Man Pass	21D19	3100	2/26	28	12.1	16.1	33.7	13.7*
Plains of Abraham +	22C1a	4400	2/26	88	41.4	58.5	--	60.6*
Smith Creek Road	22C4	2100	2/26	34	15.1	15.5	29.4	14.9*
Spencer Meadow +	21C20a	3400	2/26	20	8.6	24.3	41.4	20.2*
Surprise Lakes	21C13A	4250	2/26	56	25.3	44.0	49.6	44.8*
Table Mountain +	21C24a	4200	2/26	52	22.9	44.5	44.5	43.6*
Timbered Peak +	21D18a	3000	2/26	0	0.0	17.5	36.9	20.3*

COWLITZ RIVER

Cayuse Pass	21C6	5300	2/26	123	54.5	77.7	65.9	79.0*
Mosquito Meadows	21C19	4100	2/27	69	30.7	38.9	45.8	36.2*
Chanapecosh	21C32	2200	2/26	12	5.1	14.4	22.0	15.7*
Packwood Lake	21C31	2870	2/27	4	1.6	13.2	17.8	14.0*
Pigtail Peak	21C33	5900	2/15	94	36.7	52.4	43.3	--
			2/27	95	39.0	59.8	49.4	--

+ Snow water equivalent estimated from aerial stadia observations

Not located directly on this drainage

* Adjusted 1948-62 average

APPENDIX 8

SNOW

DRAINAGE BASIN and SNOW COURSE			1968			PAST RECORD		
			Date of Survey	Snow Depth (In.)	Water Content (In.)	Water Content (In.)		
Name	No.	Elev.				1967	1966	1948-62 Avg.

COWLITZ RIVER (Cont.)

Plains of Abraham +	22C1a	4400	2/26	88	41.4	58.5	--	60.6*
Potato Hill	21C14	4500	2/27	44	18.6	28.4	33.8	26.1*
#White Pass (E. Side)	21C28	4500	2/15	30	9.9	20.2	19.9	--
			2/29	23	9.0	20.9	21.5	21.5*
#White Pass (L. Lake)	21C27	4500	2/15	29	10.6	25.5	23.7	--
			2/27	25	11.0	24.9	29.9	--
Willame Creek	21C30	3250	2/27	28	10.3	30.9	31.3	28.8*

PUGET SOUND DRAINAGENISQUALLY RIVER

Ghost Forest	21C4	4550	2/27	31	13.3	47.2	39.7	40.2*
Longmire	21C3	2760	2/27	0	0.0	13.2	12.8	8.1*
New Paradise Park	21C35	5500	2/27	71	31.2	71.2	50.6	--
Stem Glade	21C1	5050	2/27	82	34.0	70.6	50.6	63.8*

WHITE RIVER

#Cayuse Pass	21C6	5300	2/26	123	54.5	77.7	65.9	79.0*
Corral Pass	21C13	6000	2/26	54	22.1	39.2	30.5	39.7*
#Morse Lake	21C17	5400	2/28	109	44.4	59.2	42.8	49.3*
White River Campground	21C34	4000	2/28	43	16.5	24.7	26.7	--

GREEN RIVER

Airstrip	21B24	1800	2/26	0	0.0	0.0	8.7	--
Charley Creek	21B25	1200	2/26	0	0.0	0.0	1.3	--
Cougar Mountain	21B42SP	3200	1/6	13	4.2	New Course		
			3/1	0	0.0			
Grass Mtn. No. 1	21B26	4000	2/26	0	0.0	18.6	30.2	21.9*
Grass Mtn. No. 2	21B27	2900	2/26	10	4.7	14.0	29.2	19.7*
Grass Mtn. No. 3	21B28	2100	2/26	0	0.0	0.0	7.7	--
Lester Creek	21B29	3100	2/26	28	11.4	19.2	24.8	22.3*
Sawmill Ridge	21B31	4700	2/26	35	13.4	37.2	32.2	39.7*
Snowshoe Butte	21B43SP	5000	1/6	40	14.6	New Course		
			2/5	70	22.8			
			2/26	63	26.6			

Not located directly on this drainage

* Adjusted 1948-62 averages

+ Snow water equivalent estimated from aerial stadia observation

APPENDIX 9

SNOW

DRAINAGE BASIN and SNOW COURSE			1968			PAST RECORD		
			Date of Survey	Snow Depth (In.)	Water Content (In.)	Water Content (In.)		
Name	No.	Elev.				1967	1966	1948-62 Avg.

GREEN RIVER (Cont.)

Stampede Pass	21B10	3000	2/8	46	17.4	--	21.4	--
			2/15	43	18.1	--	--	--
			2/19	48	18.2	44.6	25.9	--
			2/29	36	14.9	39.9	29.0	43.4*
Twin Camp	21B30	4100	2/26	5	2.5	23.7	23.1	27.0*

CEDAR RIVER

City Cabin	21B3	2390	2/26	4	1.8	11.9	20.6	16.9*
Mt. Gardner	21B21	3300	2/27	Not Measured		--	24.2	16.7*
Mt. Lindsay	21B16	2500	2/27	10	4.2	10.1	22.8	13.2*
Mt. Washington	21B15	3000	2/27	0	0.0	4.5	19.4	7.1*
Rex River	21B17	2400	2/27	0	0.0	7.7	21.4	14.3*
S. F. Cedar	21B6	3000	2/26	6	2.2	16.9	24.4	23.5
Tinkham Creek	21B20	3400	2/26	16	6.1	12.9	26.1	20.0*

SNOQUALMIE RIVER

#Lake Elizabeth	21B19	2900	2/28	34	15.0	39.2	47.1	--
Olallie Meadows	21B2	3625	2/21	39	18.0	--	--	--
			2/26	35	16.2	38.8	42.0	44.6
S. F. Tolt	21B18	1900	2/28	0	0.0	2.1	6.1	--

SKYKOMISH RIVER

Lake Elizabeth	21B19	2900	2/28	34	15.0	39.2	47.1	33.6*
Stevens Pass (South)	21B1	4070	2/15	66	23.8	46.6	38.2	41.4*
			2/27	63	24.2	50.3	41.4	45.9
Stevens Pass Sand Shed	21B45	3700	2/15	45	18.2	New Course		
			2/27	39	17.2			

SKAGIT RIVER

Beaver Creek Trail	21A4	2200	2/27	38	14.3	14.0	16.2	16.0*
Beaver Pass	21A1	3680	2/27	69	24.4	31.2	27.7	32.7*
#Cloudy Pass +	20A22a	6500	2/29	108	40.0	41.8	32.2	38.2*
Devils Park	20A4	5900	2/26	109	42.9	47.8	31.4	41.3*
Freezeout Cr. Trail	20A1	3500	2/27	26	8.7	12.6	10.9	13.7*
Freezeout Meadows	20A2	5000	2/27	70	27.0	29.3	31.0	29.7*
#Harts Pass	20A5A	6500	2/26	122	45.3	40.4	30.9	41.6*
Klesilkwa	Canada	3700	2/28	14	5.3	15.6	12.1	12.5*
Lake Hozomeen	21A2	2600	2/27	24	8.2	6.1	10.8	11.0*

Not located directly on this drainage

* Adjusted 1948-62 average

+ Snow water equivalent estimated from aerial stadia observation

APPENDIX 10

SNOW

DRAINAGE BASIN and SNOW COURSE			1968			PAST RECORD		
			Date of Survey	Snow Depth (in.)	Water Content (in.)	Water Content (in.)		
Name	No.	Elev.				1967	1966	1948-62 Avg.

SKAGIT RIVER (Cont.)

#Lyman Lake	20A23A	5900	Not Measured			64.0	43.1	53.0*
Meadow Cabins	20A8	1900	2/26	6	2.2	6.0	6.7	8.0*
New Tashme	Canada	2500	2/26	9	4.1	10.1	13.1	11.3
Quartette Lake	Canada	4000	Not Measured			10.7	--	--
#Rainy Pass	20A9	4780	2/26	102	37.6	44.4	28.0	39.4*
Thunder Basin	20A7	4200	2/26	39	14.9	21.8	16.8	22.9*

BAKER RIVER

Dock Butte +	21A11A	3800	2/12	88	34.8	--	60.8	65.0
			2/27	75	33.2	74.0	71.8	70.4*
Easy Pass +	21A7A	5200	2/12	116	45.8	--	68.0	--
			2/27	129	57.1	82.0	75.7	88.6*
Jasper Pass +	21A6A	5400	2/12	176	69.5	--	67.3	63.8*
			2/27	187	82.8	100.8	79.6	93.8*
Komo Kulshan	21A17	800	Not Measured			--	--	--
Marten Lake +	21A9A	3600	2/12	112	44.2	--	--	--
			2/27	104	46.1	89.2	78.0	79.1*
Mount Blum +	21A18a	5800	2/12	87	34.4	--	65.7	--
			2/27	111	49.2	79.2	79.2	--
#Panorama	21A5	4300	2/11	124	49.0	75.7	69.5	75.2*
			2/25	126	55.8	85.7	69.4	76.9*
Rocky Creek +	21A12A	2100	2/12	10	4.0	--	35.2	24.1*
			2/27	50	22.2	34.4	38.4	25.2*
Schreibers Meadow +	21A10A	3400	2/12	85	33.6	--	57.0	56.3*
			2/27	82	36.3	64.4	63.6	62.7*
S. F. Thunder Cr. +	21A14A	2200	2/12	6	2.4	--	4.0	--
			2/27	0	0.0	2.4	7.2	4.9*
Watson Lakes +	21A8A	4500	2/12	91	35.9	--	57.0	60.9*
			2/27	88	39.0	70.0	67.9	66.1*

NOOKSACK RIVER

Bald Mountain +	21A19a	4400	2/26	62	26.9	50.4	--	--
Canyon +	21A20a	5100	2/26	104	44.7	54.2	--	--
Glacier Creek	21A23	3700	2/26	13	5.4	21.2	--	--
Panorama	21A5	4300	2/11	124	49.0	75.7	69.5	75.2*
			2/25	126	55.8	85.7	69.4	76.9*
Twin Lakes +	21A21a	5200	2/26	133	57.2	68.2	--	--

Not located directly on this drainage

* Adjusted 1948-62 averages

+ Snow water equivalent estimated from aerial stadia observations

APPENDIX 11

SNOW

DRAINAGE BASIN and SNOW COURSE			1968			PAST RECORD		
			Date of Survey	Snow Depth (in.)	Water Content (in.)	Water Content (in.)		
Name	No.	Elev.				1967	1966	1948-62 Avg.

O L Y M P I C P E N I N S U L ADUNCENESS RIVER

Deer Park	23B4	5200	2/28	39	16.6	24.4	22.7	24.5*
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MORSE CREEK

Deer Park G. S.	21B13	4850	2/28	23	9.5	15.3	16.6	--
Morse Creek	23B12	5425	2/26	72	32.6	49.1	41.3	--
Cox Valley	23B14		2/26	68	28.8	New Course		

ELWHA RIVER

Hurricane	23B3	4500	2/28	42	16.5	27.0	20.9	25.1*
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SKOKOMISH RIVER

Black & White	23B7	4200	2/26	67	29.9	42.2	41.1	34.6*
Black & White Lakes	23B6	4700	2/26	81	39.0	59.2	57.8	52.3*
Four Streams	23B10	3000	2/26	57	30.1	28.7	30.4	--
Home Sweet Home	23B5	5200	2/26	125	57.2	73.8	64.8	68.2*
Sundown Pass	23B8	3900	2/26	83	41.0	58.9	57.9	48.6*

YAKIMA RIVER (Cont.)

Kachess Peninsula	21B37	2280	3/1	33	12.0	15.0	--	--
Kachess Dam	21B38	2220	3/1	0	0.0	5.2	--	--
Hyak	21B34	2600	3/1	21	9.1	17.9	--	--
Cooper Pass	21B36	3300	3/2	32	13.4	29.6	--	--
Morgan Creek	21B40	2320	3/1	0	0.0	0.0	--	--
Salmon La Sac	21B39	2340	3/1	29	8.6	16.0	--	--

Late Reports

OKANOGAN RIVER (Cont.)

Clark +	19A8a	7000	3/1	48	14.4	--	--	--
Muckamuck +	19A9a	6390	3/1	44	13.2	--	--	--
Starvation +	19A10a	6750	3/1	48	14.4	--	--	--

* Adjusted 1948-62 averages

+ Snow water equivalent estimated from aerial stadia observation

Agencies Assisting with Snow Surveys

GOVERNMENT AGENCIES

Canada:

Department of Lands, Forests and Water Resources,
Water Resources Service, British Columbia

States:

Washington State Department of Water Resources
Washington State Department of Natural Resources

Federal:

Department of the Army
Corps of Engineers
U. S. Department of Agriculture
Forest Service
U. S. Department of Commerce
Weather Bureau
U. S. Department of the Interior
Bonneville Power Administration
Bureau of Reclamation
Geological Survey
National Park Service

PUBLIC AND PRIVATE UTILITIES

Chelan County P.U.D.
Pacific Power and Light Company
Puget Sound Power and Light Company
Washington Water Power Company

OTHER PUBLIC AGENCIES

Okanogan Irrigation District
Wenatchee Heights Irrigation District

MUNICIPALITIES

City of Walla Walla
City of Tacoma
City of Seattle

Other organizations and individuals furnish valuable information for snow survey reports. Their cooperation is gratefully acknowledged.

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